



KBARA GAZETTE



Spring, 2010 The Quarterly Journal of the Kamiak Butte Amateur Repeater Association
KBARA, PO Box 30801, Spokane WA 99223-3013

Grayline Propagation

by John, W7OE

What is grayline propagation? Grayline propagation occurs near sunrise or sunset and allows for enhanced propagation due to unique changes in the ionosphere. As you SHOULD know, the ionosphere consists of several layers. For the purpose of this discussion, I will refer to the D and F layers. During the daytime, the D layer, which consists of relatively closely spaced ions, builds in density and tends to absorb low frequency signals. The low frequency signal must be at a relatively high angle to break thru the D layer (about 50 miles above the earth) to get to the higher F layer and be reflected back to earth. Low angle signals are absorbed and do not travel to the reflective F layer. Hence propagation is shortened on the low bands during the day. The higher bands are shorter in wavelength and the molecular density of the D layer has less of an effect on these bands (20 meters and higher). That is why propagation is great during the day on the higher bands. At nighttime, the D layer is reduced in density so the low-frequency signals can escape the D layer at low angles, and hence, longer distance propagation is possible on the low bands. Paradoxically, the F layer is often too thin to sustain nighttime propagation on the higher bands. The F layer, which can be several hundred miles above Earth, also consists of ionized particles. The F layer increases in density during the daytime and propagation would be enhanced on the low bands if the low-angle signals could break thru the D layer instead of being absorbed during daytime. Fortunately for DXers, at sunrise the F layer builds up while the lower D layer is still in the earth's shadow. At sunset, the F layer is still being enhanced by the sun while the D layer dissipates in the Earth's shadow. This is the Grayline Effect. Propagation is enhanced anywhere along the terminator. On 40 meters especially, stations can often be heard both long path and short path during sunrise and sunset. Even on 80 meters, I have worked Europe and Africa via Long Path Propagation. Sometimes I have heard my own signal going around the world on full-break-in C.W. There is also enhanced propagation perpendicular to the terminator (i.e. to the west during sunrise). The first hop is perpendicular to the terminator and takes advantage of the enhanced F layer while the D layer is still dormant. This effect is especially prominent on 160 Meters. March 14, 2010 I worked BU2AQ in Taiwan on 160 Meters. I could not hear him until 30 minutes before sunrise, he was copyable 15 minutes before sunrise and I called and worked him 3 minutes before sunrise with a 559 report both directions. His signal disappeared into the noise 15 minutes past sunrise. This is the Dxcitement experienced on the Low Bands during Grayline, and even a caveman can do it.





VHF Contesting by Mark, K7HPT

Why?

Why compete in a radio contest? Probably for the same reason that people play golf, fish or play bridge...for the fun of it. We get to see new places, meet interesting people, try out our equipment and hone our operating skills. That's important, because this mobile contest station can be quickly and easily converted to emergency service use, providing crucial communications support to law enforcement and emergency response teams when and where disaster strikes. What we learn about our equipment and operating techniques during a contest may make a critical difference in an emergency.

What is a Weak Signal "Rover"

In the VHF and up contest world the term "Weak Signal" does not imply QRP (low power). You could be running a kilowatt or more. A weak signal contact could be line of sight, sporadic "E" propagation, bounced off the moon, or the underside of an airplane, meteor showers or a mountain. Stations in Western Washington and Western Oregon point their beams at Mt. Rainier or Mt. Adams to bounce their signals to Eastern Washington in order to make those rare contacts with us. While most contestants operate from fixed locations at home, there is a "Rover" class for mobile stations such as this one that move from location to location. In VHF/UHF and microwave contests, only one contact per band is allowed with another station unless at least one of them moves to a different Maidenhead Grid location (see below). Rover stations like mine must operate from at least two different grids during a contest; most cover four or more grids during the contest period. Because of limited Ham population in our part of the state, Rovers are very popular with the stations on the coast but you must go up in elevation "Mountain Toping" to make contacts with distant stations.



Maidenhead Grids

Knowing the precise location of another VHF/UHF or microwave station is especially useful in aiming antennas, which on these higher frequencies are very directional. Approximately 30 years ago, European VHF and UHF amateur radio operators, meeting at Maidenhead, England, adopted a worldwide location-designation system. The Maidenhead Grid System divides the world, whether land mass or ocean, into rectangular grids. They're not really "squares" even though they are commonly referred to as "grid squares". Latitude and longitude lines are used to form the boundaries. Each grid is one degree of latitude and by two degrees of longitude, and is identified by a unique, four-character alpha-numeric designation. The Pacific Northwest is in the CN field, so common grid designators are in the CN70, CN80 or CN90 series. Farther east in Washington and Oregon, you will encounter the DN00 and DN10 series. Some examples: Spokane is DN17, Colfax, DN16, Colville DN18. With only short moves; I can operate from four different grids. Portland falls just inside CN85; Eugene straddles CN83 and CN84; and Medford is in CN82. Seattle is in CN87 and Vancouver BC is in CN89.

How do I know where I am?

For rover stations like this one, identifying the correct Maidenhead Grid locator is critical. Some rovers use detailed maps; however, many of us now also use Global Positioning System (GPS) receivers to pinpoint our exact location. With a system of orbiting

satellites overhead, the GPS unit can show the location within a few feet! Some of the more popular units even read out the position directly in the Maidenhead Grid system.

What kind of radios are we using?

My station uses a pair of transceivers and a transverter, an Icom IC-7000 for 6 meters and a transverter that converts 10 meters to 222cm, and an Icom IC-910H that covers 2 meters, 432cm and 1296cm. To get started you can often find an Icom 706 with 6 and 2 meters and 432cm for less than \$500 on Ebay. The 6 and 2 meter bands are VHF. 1 $\frac{1}{4}$ meter (222 MHz) and 70cm (432 MHz) are UHF and 23cm (1296 MHz) is Microwave. Some of the guys are regularly making contacts on bands as high as 10 GHz! With good conditions you can work EME (Earth Moon Earth) contacts with 100 watts a good yagi and your radio connected to the sound card of your PC running free software called JT65. The power levels I run range from 60 watts on 1296 MHz to 400 watts on the VHF bands. Most transmissions are done in the single-sideband voice mode; however, we also use FM, CW (Morse code) and Digital (PSK31, RTTY, JT65) when needed. Note that contacts made through a repeater system do not count. Two types of antennas are used. The loops cover the lower bands and are used primarily while traveling. They provide moderate gain and are essentially omni-directional. When stopped, we set up a small mast in the trailer hitch receiver mount for three or four high-gain Yagi antennas. An additional front mount supports additional

Yagi antennas. All my antennas are manufactured by a company called M2 Inc. 3 elements for 6 meters, 9 elements for 2 meters, 10 elements for 222 MHz and 28 elements for 432 MHz. On 1296 MHz I use a pair of 22 element antennas phased together. These antennas provide much higher gain than the loops and are quite directional, allowing us to work over much longer distances. Contacts are logged on paper or a laptop computer running special software and then turned into the sponsoring organization after the contest is over. You do not have to be in the contest or have an all mode radio to help a contestant make points. All you have to do is make a simplex call to a contestant and he will get credit for it. (Hint... my next contest will be June 12th - 14th) If you would like to know more about this fun activity, contact Mark; K7HPT, John; W7OE or the Pacific North West VHF Society at www.pnvhfs.org

Thanks to Jim, W7DHC for parts of this article.



KBARA REPEATER FUND MEMBERS 2009-2010 We wish to thank the following contributors for their very generous donations to our Repeater Fund.

Bronze Membership \$1-\$20

Kenneth, KE7AWZ
Christopher, WX7B
Daniel, KE7BEM
Falah, KF7EPB
Linda, KE7EZK
Joseph, KC7GKY
William, KF7GLL
Jack, W7HNH
Gary, KE7IAT

John, KF7AZP
Bev, WATBEV

Delvin, K7BM
Mark, W7BRT

John, K6II
Art, W9IIT
Robert, AD7LJ
Leonard, K7LRG
Michael, WA7MJB
Duane, KE7NUB
Roland, WA7REC
Jim, N7RHX
Robert, KE7RSD

Silver Membership \$21-\$49

Robert, W7GSV

Gold Membership \$50-\$100

Mark, K7HPT
Bruce, KE7KHU

Platinum Membership over \$100

Ed Johnson & Juanita Johnson

Tom, WA7TMB
Kenneth, W7WET
Richard, N7XKC
Roger, KE7YBU
Alma, KB7YLO
Derek, KE7ZMC
Jay, N7ZUF

Larry, AD7NH

John, W7OE
Wilber, KD7QLT

KBARA Members for 2010

Call	Name	Call	Name	Call	Name
	Flathead Valley Repeater	KE7KHU	Bruce Bromley	K3SHD	C. Victor Bak
	Juanita Johnson	KE7KHV	Jeanetta R. Taylor Taylor	KA7SUZ	JoAnn Gemmrig
W7ALT	Ed Johnson	K7KLA	Brandon McKinney	N7TCN	Stanley R. Johnson Sr.
KG5AO	Sarah Wilson	VE7KLI	Dona Mottishaw	WA7TMB	Tom Brewer
WB7AUK	Walter A. Davis	W7KLL	Kenneth L. Lindahl	KB7TYR	Kerry Griffith
KE7AWZ	Steve Krause	AD7KV	Scott B. Grimmett	KB7VCA	Betsy Grimmett
KF7AZM	Art Gemmrig	KE7LAQ	David Lynch	KC7VGT	Dale M. Wiliams
KF7AZP	Brandon Turner	KC7LBY	Daniel G. Penny	KF7VH	Patrick Brandt
WX7B	John D. Kimball	AD7LJ	Robert M. Purdom	WB7VKX	Larry L. Says
KE7BEM	Christopher J. Pritchard	N7LKG	Bill Korfhage	K7WET	Kenneth J. Davis
WA7BEV	Daniel Anderson	KD6LLL	Patricia B. Chambers	K6WIZ	Frederick J. McDonald
K7BM	Bev Starbuck	K7LRG	Leonard Gross	N7WRQ	Elizabeth Ashleman
W7BRT	Delvin G. Workman	N7LVO	Neil P. Gallup	N7WRR	James Ashleman
WA7CBX	Mark R. Bamford	WA7MJB	Michael J. Brewer	KB7WTO	Royal Moore
KB7CIH	Bernie Frazier	K7MM	Dan Ransom	K0WZA	Donald J. LaFavor
K7CYZ	Danny Dilg	K7MMA	Michael E. West	AD7XH	Richard L. Schultz
KD7DDQ	Richard E. Hazelmyer	AC7MV	David L. Snyder	N7XKC	Richard L. Wurdack
KI6DER	Ken Crosswhite	AD7MW	James L. Henderson	KE7YBR	Douglas R. Williams
KE7DOQ	Thomas J. Storer	N1NG	Michael Maxson	KE7YBU	Roger Moore
K7EFX	Carl M. McDonald	AD7NH	Larry L. Stevens	KB7YLO	Alma J. Vogt
KF7EHT	John Brackemyre	N6NHJ	John L. Grimaldi	KC4YTZ	Richard Fleetwood
KF7EPB	Michael J. Sirott	KC7NOA	Michael J.D. Durkin	KE7ZMC	Derek Ingalsbe
W7EWZ	Falah H. Abdulla	W7NSY	William E. Wilson	N7ZUF	Jay F. Lopes
KE7EZI	Stanley R. Staves, Sr.	KE7NUB	Duane Statler	AD7ZZ	Tom Woodrow
KE7EZK	Steven M. Holman	WB7NUE	Gerald Harnois		
WJ7F	Linda L. Anderson	KE7NWL	Chris Grimmett		
N9FOX	Bob Ryno	AK2O	Karl Shoemaker		
KD7FYE	Barbara J. Moore	W7OE	John P. Dempster		
KB7GJY	Kenneth L. Lindahl Jr.	VE7OLV	Oliver Amateur Radio Club		
KC7GKY	Allen Gemmrig	KB6OMQ	Mischelle J. St Cyr		
KF7GLL	Joseph P. French	KC7OQR	Cathie Hebel		
AC7GP	William (Ted) Hight	KC7OQS	George Hebel		
W7GSV	Bob Meenach	KC7ORO	Denise Hebel		
VA7GV	Robert M. Rosie	AA7P	Richard J. Hebel		
WA6GWP	Guy Venne	W7POV	Michael R. Cramer		
KF7HAL	Emilie J. Whitlatch	KE7PSQ	Cameron Alderson		
W7HFI	Doug Roquet	KE7PSR	Ronald L. Alderson		
KE7HHL	Robert Lemon	WA6PTO	Charles A. Whitlatch		
W7HNH	Gene E. Mertz	KC7QGV	Mary Beth Snyder		
K7HPT	Jack Williams	KD7QLT	Wilber H. Earl		
K7HRT	Mark Van Winkle	KE7RAP	Robert A. Peterson		
KE7IAT	Patrick P. O'Dea	WA7REC	Roland E. Carman		
K6II	Gary Roth	WB7RED	M.D. "Red" Nierstheimer		
W9IIT	John David Wittenbecher	N7RHX	Jim Lawrence		
W7JJL	Arthur R. Vogt	WA7ROS	Anna M. Reeves		
WA7JMJ	John J. Lally	KC7RQF	Charlene E. Davis		
KE7KHR	Gerald E. Cook	KE7RSD	Robert A. Pekich		
	Patricia Henderson	WA7RVV	James L. Reeves		
		KG7SD	Richard Thornton		

KBARA CAMPOUT/ANNUAL MEETING

MARK YOUR CALENDARS

This year our KBARA campout will be at

KETTLE FALLS LOCUST GROVE GROUP SITE

just outside of Kettle Falls, WA

on the Columbia River, July 15th through the 18th. For more info contact

markvanwinkle@comcast.net &

<http://www.kbara.org/>

Please remember to renew your membership for 2010

Name _____

Call Sign _____

Address _____

City/State _____ Zip _____

Telephone _____ Amount Paid _____

E-Mail _____ ARRL Member? _____

Would you rather receive the newsletter via computer, instead of receiving it in the mail? YES NO

Dues are a minimum of \$15.00 per year for individuals and \$20.00 for a family (all must be living at the same address), but any amount will be greatly appreciated. Dues are due January of each year. If they are paid between September 1 - December 31, they will be applied through the entire following year. And any additional amount will be gratefully accepted to the Repeater Fund. To support KBARA, please send your contributions to: KBARA, PO Box 30801, Spokane WA 99223-3013 Please visit our KBARA website for more information: <http://www.kbara.org>



KBARA Membership / Support Information The KBARA repeater system consists of several privately owned linked Amateur Radio repeaters. It covers an area from northeastern Washington to northeastern Oregon, and from western Montana to central Washington. The KBARA system is also part of the Evergreen Intertie, an interconnected group of repeaters located in western Washington and Oregon. The primary purpose of the KBARA repeaters is to provide a means for emergency communications within the above areas, and secondarily for routine radio traffic. It makes possible a single system of mobile communications coverage, extending the limited range provided by any single repeater operation. The KBARA FM repeaters operate in the VHF bands and are linked by UHF radios. The repeaters' frequencies, call signs, locations and owners are as follows:

KB7ARA REPEATERS

146.74 W7HFI Kamiak Butte, near Pullman, WA, owned by Bob, W7HFI, John, W7OE, & KBARA, KB7ARA

147.02 K7HPT Lookout Pass on I-90 on the Idaho-Montana border, owned by Mark, K7HPT, & John, W7OE

147.28 KD7DDQ Pikes Peak in the Blue Mountains, SE of Walla Walla, WA, owned by Ken, KD7DDQ & Mark K7HTP

147.36 N1NG Stensgar (Stranger) Mountain, near Chewelah, WA, owned by Mike, N1NG, & John, W7OE

147.38 W7OE Mica Peak, east of Spokane, WA, owned by John, W7OE

223.90 AK2O Stensgar (Stranger) Mountain, near Chewelah, WA, owned by Karl, AK2O

444.35 N1NG Mica Peak, east of Spokane, WA, with a 192.8 Hz tone, owned by Mike, N1NG

53.750 N7ZUF Kamiak Butte, near Pullman, WA, owned by KBARA, KB7ARA

IRLP Node #3957 N1NG South Hill of Spokane, WA, owned by Mike, N1NG

All licensed Amateur Radio operators are welcome to use this open repeater system. Your support would also be greatly appreciated.

Please visit these websites for more information: <http://www.kbara.org> and visit <http://groups.yahoo.com/group/evergreenintertie>

To support KBARA, please send your contributions to: KBARA, PO Box 30801 Spokane WA 99223-3013	Annual support is \$15 per calendar year for a single membership and \$20 for a family membership. Dues are due in January of each year and if paid between September 1 and December 31, they will be applied through the entire following year. Also, any contribution will be gladly accepted to the Repeater Fund.
--	---

KAMIAK BUTTE AMATEUR REPEATER ASSOCIATION

PO Box 30801
Spokane WA 99223-3013